HealthAI Assistant Documentation

Introduction

Project Title: Health AI Intelligent Health Care Assistant

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1. Project Overview

- Project Name: HealthAI Assistant
- Purpose: A medical AI assistant that helps patients with disease prediction, treatment suggestions, health analytics, and medication information.
- Technology Stack: Python, Gradio, Transformers (IBM Granite 3.2-2b Instruct model), PyTorch, Pandas, Plotly, Streamlit (optional), PyNgrok.
- Key Features:
  - Symptom-based disease prediction
  - Personalized treatment plan generation
  - AI-powered patient chat
  - Health analytics dashboard
  - Tablet/medication reference

2. System Architecture

- Front-End: Gradio interface with tabs for Disease Prediction, Treatment Plan, Patient Chat, Health Analytics, Tablet Info
- Back-End:
  - IBM Granite AI model for NLP tasks
  - Functions for generating responses, analyzing symptoms, producing health insights
  - Data handling using Pandas
- Optional Deployment: Streamlit + PyNgrok for web deployment

3. Installation & Setup

```bash
# Install dependencies
pip install transformers torch gradio -q
pip install streamlit pandas numpy plotly datetime timedelta -q
pip install streamlit pyngrok
```

- Load IBM Granite Model:

```python
from transformers import AutoTokenizer, AutoModelForCausalLM
tokenizer = AutoTokenizer.from_pretrained("ibm-granite/granite-3.2-2b-instruct")
model = AutoModelForCausalLM.from_pretrained("ibm-granite/granite-3.2-2b-instruct")
```

- Run Application:

```python
app.launch(share=True)
```

- Supports CPU or GPU execution automatically.

4. Functional Modules

4.1 Disease Prediction
- Input: Symptoms
- Output: Possible conditions, general medications, lifestyle suggestions
- Method: Uses Granite AI model with custom prompt

4.2 Treatment Plan
- Input: Condition, Age, Gender, Medical History
- Output: Personalized treatment suggestions including home remedies, medications, precautions

4.3 Patient Chat
- AI-powered chatbot for answering health queries
- Maintains conversation history

4.4 Health Analytics
- Generates sample patient health data (heart rate, blood pressure, glucose)
- Produces charts (line charts for trends, pie chart for symptom frequency)
- Provides AI insights

4.5 Tablet Information
- Displays information about 15 popular medications
- Includes purpose of each tablet

5. User Guide

1. Save Patient Profile: Fill in patient info on the left sidebar and click Save Profile.
2. Disease Prediction: Enter symptoms → click Analyze Symptoms → view possible conditions.
3. Treatment Plan: Enter condition, age, gender, history → click Generate Treatment Plan.
4. Patient Chat: Type question → hit Enter or submit → chatbot responds.
5. Health Analytics: Click Generate Analytics → view charts and insights.
6. Tablet Info: Browse 15 common medications with purposes.

6. Sample Outputs

- Disease Prediction: "Possible conditions: Common Cold, Flu; Suggested medications: Paracetamol; Consult a doctor for further evaluation."
- Treatment Plan: Personalized instructions including home remedies and precautions.
- Patient Chat: Interactive Q&A responses.
- Health Analytics: Heart rate chart, symptom frequency pie chart, textual health insights.

7. Future Enhancements

- Integration with real patient data
- Cloud deployment with secure access
- Multi-language support
- Voice-based interaction
- Integration with wearable health devices